Applicants extend their many thanks to the Examiner for indicating Claim 14 as allowable. Applicants, at the present time, acknowledge the allowability of the claim and seek the allowability of the remainder of the claims.

A. Technical Argument

Claims 5-9 and 16-25 stand rejected under 35 USC §112, 1st ¶, which is not described in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner contends that Applicants have not provided adequate support for the broadly claimed genus of avian reoviruses that are present in the vaccine composition. The Examiner particularly states, on page 2 of the office action, that an invention is not adequately described when there is no described or art recognized correlation or relationship between the structure of the invention and its function. However, Applicants disclosure does provide an art recognized correlation between the structure of the invention and the function. In light of the following remarks, Applicants respectfully request reconsideration of the rejection.

In brief review, the Examiner contends:

1. The inventors had possession of the claimed invention,

2. The invention is not adequately described in the sense that the invention is merely defined with its function and that there is no art recognized correlation or relationship between the structure of the invention and its function.

Applicants respectfully request reconsideration.

First, Applicants will show, with unequivocal proof, that the art recognizes characterization of viruses by antigenic property.

In a host animal a virus will elicit an immune response, that is to say, a multitude of different antibodies are produced by the host's immune system. These antibodies are directed to the various antigenic determinants on the virus. Some of these antigenic determinants are capable of inducing a virus neutralizing antibody response. Virus neutralizing antibodies neutralize the activity of the virus once it react/binds again with the virus.

A skilled artisan (one skilled in the art) knows that specific antiserum raised against a virus can be seen as an (antigenic) "fingerprint" of the virus, and as such defines the virus in a technical sense, because the antiserum harbors the information concerning the antigenic epitopes present on the virus. For that reason, immunological assays are commonly used in this field to characterize a virus antigenically. These assays provide information concerning the presence or absence of an (antigenic) relationship between two or more viruses.

In other words, a virus neutralization test is the test of first choice of a skilled person to determine the identifying characteristics of the virus. The antigenic properties of a virus determined in a virus neutralization assay (as defined in the present claims) are one of the most important properties of a virus and represents a direct translation of the (antigenic) structure of the claimed viruses.

Referring to the Examiner's own words: the application does provide an adequate description of the invention, because it does describe the invention by means of "an art-recognized correlation or relationship between the structure of the invention and its structure."

Further evidence that a virus neutralization assay is an art accepted term is provided by many references, including, but not limited to:

Statements made in the Nersessian et al., previously submitted (and other textbooks):

Nersessian et al.

"Because the HI test is not suitable for avian reoviruses, their antigenic characterization has been determined by VN (= virus neutralization), complement-fixation, fluorescent antibody....." (see page 1475, left column).

"..the conventional plaque-reduction neutralization assay, the latter is still widely used for determination of antigenic relationships between virus isolates." (see page 1475, right column).

McNulty (Chapter 13 "Reovirus" in Virus infections of birds, eds: Mc Ferran and McNulty, Elsevier Science Publishers, 1993)

"Serological tests to detect antibody to avian reoviruses include AGID, virus neutralization by both plaque reduction (..) and microculture (..) techniques, CF (..), ELISA (..) and indirect IFT (..). The neutralization tests detect type-specific antibody while the other tests mainly detect antibody to the group antigen" (see page 187).

McIntosh (Chapter 14 "Diagnostic Virology" in Fields Virology, eds: Fields et al., Lippincot-Raven Publishers, NY, USA, 401, 1996)

"Methods for the measurement of antibodies to viruses can be divided into the following groups: (c) those that measure directly the capacity of antibody to block some specific viral function. ..... Examples of the third are neutralization, hemagglutination inhibition and neuraminidase inhibition..." (see page 409, paragraph bridging left and right column).

"Finally, tests of the third type depend on specific viral functions and, hence, may be quite selective. Thus, virus neutralization measures solely antibodies to antigens (often very specific antigens) on the virus surface." (page 409, right column).

Applicants have included copies of the references with this response.

Therefore, it should be concluded that the definition of the viruses as used in the claims:

- Is by means of an art-accepted manner
- that characterizes the structure of the viral antigens
- in a type specific/selective manner
- thereby providing the possibility to identify isolates of a certain virus type that are antigenically closely related (on the one hand) and to identify isolates that are antigenically distinguishable from that virus (on the other hand).

The Examiner appears to be of the opinion that for the identification of a "biomolecule," its amino acid or the nucleotide sequence of the gene encoding the biomolecule or its molecular weight, etc. should be provided. However, the subject of the present invention is not a "biomolecule" as envisaged by the Examiner, it is not an isolated protein or nucleic acid fragment. Instead, it is a living complex organism that is composed of a multitude of molecules, such as a multitude of proteins, a complex genome harboring many genes, glycoproteins etc.

It is accepted in the technical- and patent field that in order to characterize micro-organisms, a sample of an isolate of that micro-organism is deposited with an authorized Depository Institute (such as ATCC, Institute Pasteur), and that the (antigenic) properties of related isolates are further characterized by immunological parameters such as used in the present claims.

Furthermore, the examiner states that the fact that the present avian reovirus does not react with a small group of monoclonal antibodies (as shown in Table 3) is not a defining property of a virus type. However, one skilled in the art would disagree with the Examiner. As prior art publications illustrate, the pattern of reactivity (+/-) of a panel of monoclonal antibodies is able to define the antigenic differences between reovirus isolates and that this was used by Vakharia et al. (see specification on page 7, lines 7-13).

Accordingly, one skilled in the art would understand that the avian reoviruses as defined in claim 3 do not react with the three specified Moabs is very relevant for the present invention.

From the lack of reaction, it can be concluded that avian reoviruses of the present invention lack certain antigens that are present on the avian reoviruses known thus far. The problem in the practice of avian (reo)virus vaccination is that such emerging mutants can escape from vaccination with the classical virus strains because these classical viruses do not induce the proper immune response that can eliminate the new virus mutants that are antigenically different (see also specification on page 4, lines 1-3). Therefore, new vaccines based on the newly identified viruses would be more effective in protecting animals against infection with these newly identified viruses.

Accordingly, Applicants respectfully request reconsideration.

Secondly, Applicants have provided numerous examples of isolates of the present invention. (specification page 4, lines 15-25). Tables 2 and 3 demonstrate that the inventor had possession of a multitude of ERS isolates at the time the application was filed. This multitude of ERS isolates are now subject of the present claims and are defined and grouped together in an art-recognized manner, such that they are distinguished from the prior art avian reoviruses. Therefore, the written description requirement is satisfied.

B. Legal Argument

In regards to the Section 112, 1st paragraph rejection, the Examiner cites several cases that the Examiner contends support the rejection. However, a review of the cases illustrates otherwise.

The first two cases, ***In re Rasmussen***, 211 USPQ 323, 326 (CCPA 1981) and ***In re Wertheim***, 191 USPQ 90, 96-97 (CCPA 1976) stand for different propositions than purported and cannot be applied to the facts of the present case.

In re Rasmussen is the Court of Customs and Patent Appeals differentiating a Section 132 new matter rejection from a Section 112 rejection. The case does state that the proper basis for a rejection of a claim amended to recite elements thought to be without support in the original disclosure is Section 112, 1st ¶. In the present application, Applicants did not amend the claims to add matter not disclosed in the specification. Accordingly, the case offers no support for the rejection.

In re Wertheim was a case concerning whether the PTO could correctly reject an application for lack of literal support of a claim limitation. ***See Wertheim***, 191 USPQ at 95-99. The Court of Customs and Patent Appeals stated a test that survives even today. The Court began by stating that enablement under §112, 1st ¶, is a factual question. ***See id*** [The primary consideration is factual and depends on the nature of the invention and the amount of knowledge imparted to those skilled in the art by the disclosure.]

In the present case, those skilled in the art recognize plaque reduction assays as appropriate means for classification. In fact, the prior art has accepted plaque reduction assays for classification of avian reoviruses from before 1980. [Wood et al., *Serological Comparisons of Avian Reoviruses*, 1980:90, J. Comp. Path., pp. 29-39 (hereinafter referred to as the Wood article)].

The Wood article states that mammalian reoviruses have been grouped into 3 serotypes according to their behavior in hemagglutination inhibition and virus-neutralization tests. [Rosen, 1960; Bruggeman and Versteeg, 1973; the Wood article, p. 29]. Further, as Applicants stated in there specification at page 5, lines 4-9 and in their response to the office action of May 28, 2002, prior art documents confirm that the plaque reduction assay/virus neutralization test is an art recognized correlation and relationship between the class of avian reovirus and the plaque reduction. [Nersessian et al. (J. Vet. Res. N50, 1989, pp. 1475-1480)]. Accordingly, the prior art validates the use of plaque reduction assays for determining and characterizing antigenic relationships between reovirus isolates. Therefore, according to the proposition for which the Examiner cited ***Lockwood v. American Airlines***, 41 USPQ2d 1961 (Fed. Cir. 1997), Applicants invention is enabled because those skilled in the art would contemplate a plaque reduction assay for determining and characterizing antigenic relationships between avian reovirus isolates.

However, in an abundance of caution, Applicants would prefer to state the primary proposition of the case. Applicants will begin with other cases cited by the Examiner.

The ***Bell*** case holds that because of the degeneracy of the genetic code, there are a vast number of nucleotide sequences that might code for a specific protein and it is impermissible to render obvious the claim because the amino acid sequence of the translated protein is known. ***See In re Bell***, 26 USPQ2d at 1529, 1531-1532 (Fed. Cir. 1993). The case concerned an improper finding of obviousness and the teaching of the prior art, not that the structure of a sequence is not sufficient as an identifying characteristic for written description purposes. ***See id.*** Here, in the present case, the issue is whether the claims (5-9 and 16-25) contain subject matter which was not described in the specification in such a way as to reasonably convey to one of ordinary skill in the art that the inventor(s), at the time the invention was filed, had possession of the claimed invention. See Office Action of October 22, 2002, pp. 1-2. Therefore, this case is not on point and offers no support for the rejection.

Likewise, ***In re Deuel***, 34 USPQ2d 1210 (Fed. Cir. 1995) is a case about obviousness and does not concern whether the claims (5-9 and 16-25) contain subject matter which was not described in the specification in such a way as to reasonably convey to one of ordinary skill in the art that the inventor(s), at the time the invention was filed, had possession of the claimed

invention. See Office Action of October 22, 2002, pp. 1-2. The holding of ***Deuel*** is that a general motivation to search for some gene that exists does not necessarily make obvious a specifically-defined gene that is subsequently obtained as a result of that search. ***See id.*** at 1215. Accordingly, this case is not on point.

Proceeding on to the ***Lockwood v. American Airlines, Inc.***, 41 USPQ2d 1961 (Fed. Cir. 1997), the question answered by the Court in the case was whether a prior application itself must describe an invention, and do so in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed subject matter as of the filing date sought, not whether a claimed invention is an obvious variant of that which is disclosed in the specification. ***See Lockwood***, 41 USPQ2d at 1966 ("it is not a question of whether one skilled in the art might be able to construct the patentee's device from the teachings of the disclosure ... Rather, it is a questions whether the application necessarily discloses the particular device.") Accordingly, while the case does state the proposition of law cited by the Examiner, the context was in relation to whether a chain of applications in a priority document complied with the written description requirement, whether an earlier filed document from which priority was claimed disclosed the invention claimed in a later application. ***See id.*** Accordingly, the fact scenario is vastly different and the logic of the case wholly unrelated. Therefore, the citation of law from ***Lockwood*** is not analogous to the instant

fact situation. However, as stated, Applicants agree with the general proposition of law and further assert that they have met the requirements for §112, 1st paragraph, enablement.

The Examiner's citation of ***Fujikawa v. Wattanasin***, 39 USPQ2d 1895 (Fed. Cir. 1996) assists in establishing that there is adequate written description/enablement for this case. To begin, and quoting from the MPEP, "[i]n exchange for the patent rights granted, 35 U.S.C., first paragraph, sets forth the minimum requirements for the quality and quantity of information that must be contained in the patent to justify the grant." See MPEP §2162 (August, 2001). Further, as the MPEP states, "[t]here is a strong presumption that an adequate written description of the claimed invention is present when the application is filed." ***In re Wertheim***, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976). The CCPA stated that the PTO has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims. ***See id.*** Here, the Examiner has only cited case law and propositions of the law. Applicants have submitted proof that a plaque reduction assay/virus neutralizing assay is an art accepted method and/or process for classifying avian reoviruses. Therefore, one of skill in the art would recognize a description of the invention defined by the claims from the disclosure. The rejection is improper.

Accordingly, if the art field uses plaque reduction assays for classification purposes, ***Fujikawa***, 39 USPQ2d at 1905 stands for the proposition that the disclosure is adequate and enabled. Therefore, the Examiner's own case establishes that the application is enabled.

Fujikawa discusses the fact scenario somewhat similar to the present case. In the ***Fujikawa*** case, it was determined by the Examiner and Board (which the Fed. Cir. affirmed) that the patentee's disclosure of a chemical compound genus with a few moieties without guidance did not enable the entire genus. The Fed. Cir. Stated a very useful test that can be applied here.

The Fed. Cir. analogized a genus and its constituent species to a forest and its trees. The Court stated that it was an old custom to mark trails by making blaze marks on trees, analogizing the blazed trees to the species in a genus. The Court went on to state that it is of no help in finding a trail through the trees when one is confronted simply by a large number of unmarked trees. ***See Fujikawa***, 39 USPQ2d at 1905. To define a class, Courts look for 'blaze marks' which single out particular trees within the forest, class. ***See id.*** Here, Applicants have shown the 'blaze marks on the trees within the forest.'

Reference to Tables 2A, 2B, and 3 of the present application illustrate numerous isolates within the well-defined novel antigenic class. Reference to Table 2A illustrates that ERS-1, ERS-2, and ERS-3, all different isolates, all fall within the claimed class description of a vaccine comprising an avian

reovirus belonging to an antigenic class of avian reoviruses, wherein the avian reovirus is able to induce antiserum in an animal, which antiserum causes a reduction of the plaques formed by avian reovirus ERS, a sample of which is deposited at the ECACC under accession no. 99011475, of at least 75% in a plaque reduction assay and a pharmaceutical acceptable carrier or diluent. This type of evidence is a 'blaze mark' as referred to by the Federal Circuit. Applicants have identified how the individual members fit within the defined class, 'the path through the forest.'

Moreover, Applicants have specified further 'blaze marks' in Table 2B. Accordingly, this is not a case where species of the class have been defined without establishing the 'blaze marks.' However, in an abundance of caution Applicants provided additional 'blaze marks' to the claimed class in Table 3. The data in Table 3 provides additional evidence, through monoclonal antibody binding, panel pattern, of 'blaze marks' through the class defined in Applicants' claims. Accordingly, the case cited by the Examiner establishes that the claim language used by Applicants does allow one skilled in the art to envisage the claimed subject matter. ***See Fujikawa***, 39 USPQ2d at 1905. Therefore, Applicants have established the scope of the claimed subject matter.

Accordingly, the long recitation of cases by the Examiner do more to establish enablement than to establish non-enablement.

The Examiner concludes the rejection by stating that the application "fails to provide adequate guidance pertaining to a number of these factors[, provided by the proceeding cases,] as follows." See Office Action of October 22, 2002, p. 4. The Examiner proceeds to list four (4) factors. However, it should be remembered that the propositions for which the cases were cited were incorrect. Applicants will address each of these in turn.

First, the Examiner states that applicants have failed to provide the complete nucleotide or amino acid sequence of any given avian reovirus. Then, the Examiner states that Applicants have only isolated one ERS. However, as is abundantly clear from Applicants' disclosure, there have been numerous ERS isolates. For example, Table 3 illustrates 13 separate isolates. Therefore, this factor is incorrect and entitled to no weight. Applicants respectfully request reconsideration.

Second, the Examiner states that Applicants use of q plaque reduction assay and monoclonal panel pattern are insufficient to distinguish one avian reovirus from another. However, as stated in Applicants specification, page 5, lines 4-9, the plaque reduction assay is an art accepted manner of characterizing avian reoviruses. Nersessian et al. (J. Vet. Res. N50, 1989, pp. 1475-1480). Moreover, Applicants went further by citing other prior art that indicates a plaque reduction assay is an art accepted process for characterizing avian reoviruses. See the Wood article. The law is clear, the standard is whether the invention would be enabled to one of ordinary skill in the art.

See In re Wertheim, 191 USPQ at 97. Here, the invention is enabled to those of ordinary skill in the art. Therefore, this factor is incorrect and entitled to no weight. Applicants respectfully request reconsideration.

As to the third factor raised by the Examiner, the Examiner repeats his criteria for rejection from the second factor. The law requires that Applicants claims their invention in such a way that it would be enabled to one of ordinary skill in the art. ***See In re Wertheim***, 191 USPQ at 97. Here, as stated above, this application is enabled to one of ordinary skill in the art. Therefore, this factor is incorrect and entitled to no weight. Applicants respectfully request reconsideration.

Finally, the fourth factor used by the Examiner relies upon classification using a plaque reduction assay to state that a plaque reduction assay illustrates that there is genotypic/phenotypic heterogeneityin avian reoviruses. Applicants find it ironic that the Examiner states that the use of a plaque reduction assay is insufficient to establish enablement of a class of reoviruses, but sufficient to establish that there are classes of reovirus. In essence, the Examiner has repeated his rejection of a plaque reduction assay as an enabling process for differentiating a class of avian reoviruses because Applicants the Examiner states Applicants did not provide any guidance pertaining to the molecular determinants that modulate the desired phenotype of the virus. However, as Applicants have asserted above, the law does not require anymore than enabling the invention to one of ordinary skill in the art.

Here, Applicants have enabled the invention to one off ordinary skill in the art.

Therefore, Applicants respectfully request reconsideration of the rejection.

II. CONCLUSION

In light of the Argument above, Applicants respectfully request reconsideration of the rejection. Applicants further respectfully request an interview with the Examiner to further the prosecution of the case. Please charge any required fees to deposit account 02-2334 and credit any credits.

Date: 2/13/03

Sincerely,

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